FRIEDRICH AUGUST FERDINAND CHRISTIAN WENT
1863—1935

Vol. 11 No. 2

PLANT PHYSIOLOGY

APRIL, 1936

F. A. F. C. WENT[1] (1863–1935)[2]

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(WITH PLATE II)

FRIEDRICH AUGUST FERDINAND CHRISTIAN WENT was born in Amsterdam, Holland, on June 18, 1863, and died in Wassenaar, July 24, 1935. Between these two dates was a human life, composed of those elements common to all of us, and of experiences and achievements common to no other. To recognize this is one thing; to describe it is another.

WENT was the eldest son of JOHANNES and JOHANNA WENT. His father, JOHANNES WENT, prepared for the ministry, but when he received the degree in theology there were more candidates than pastorates, and he became a stockbroker. The son passed through the Amsterdam schools and in 1880 matriculated in the University of Amsterdam as a student of Botany. One can recognize in the manner of his thinking, the course of his teaching, and the products of his pen in after life, the impress of his teachers during the years of academic preparation. They were VAN'T HOFF, VAN DER WAALS, MAX WEBER, OUDEMANS, and DE VRIES. Sound training, real facts, and with them the example and the inspiration to explore, to conjecture, and to experiment. The Doctor's degree was conferred upon him in 1886. In his dissertation on the earliest stages of vacuoles he reported his observation that vacuoles arose, in the plants which he studied, only by division of preexisting vacuoles, and not *de novo*. The bearing of this on cytomorphology I need not point out. For some years he continued his studies of vacuoles in land plants, and in marine plants (in Naples, 1888), in the meantime studying in STRASBURGER'S laboratory in Bonn, and with VAN TIEGHEM in Paris. By these visits to other countries he improved his lin-

[1] The accompanying portrait of WENT is a reproduction of a pastel from life by H. J. HAVERMAN. The original is in the collection of portraits of Eminent Naturalists, Stanford University.

[2] Acquaintance has been supplemented by dates and data generously furnished by Professor F. W. WENT, of the California Institute of Technology in Pasadena, to whom I express my appreciation and gratitude.

guistic accomplishments, thus facilitating the expression of his generous spirit and promoting that international cooperation which is the recognition of the unity of science, as of the fine arts.

Like many other Netherlands botanists, WENT spent several years in Java, the first few months in the famous Botanical Garden in Buitenzorg, the later years as Director of the Agricultural Experiment Station of West Java. Whether because of TREUB'S cosmopolitan character and interests, or of the liberality of the Netherlands Government, at all events the Garden, under TREUB'S direction, became the Mecca of botanists the world over. Many visited this tropical botanical garden, seeing what plants can do when supplied with warmth, water, minerals, and solar energy in abundance. In such an environment the abundance intensifies and makes very real the struggle for existence. Pests and parasites thrive no less than their hosts. Hence, when WENT was appointed Director of the Sugar Cane Experiment Station, he undertook the study of sugar cane diseases. His study quickly showed the need of knowing the normal physiology of a plant in order successfully to combat its diseases. Another result was the rescue of the Javanese sugar industry then threatened with destruction by the so-called "sereh" disease. WENT'S success in this respect no doubt reinforced his contention that the colonial agricultural experiment stations should not be directed exclusively from any home office, but that they should be autonomous, free to study, and to meet local needs.

These revealing years in the tropics, following a few years of filtering his knowledge by what we should call high school teaching, led to WENT'S appointment in 1896 as Professor of Botany in the University of Utrecht, a position which he filled, and filled increasingly, until his retirement in 1934.

The members of this Society most naturally associate WENT'S name with studies in plant physiology; but that his knowledge and his interests were not limited to physiology, or to physiology as applied to industry, is proved by his contributions to the development of science in many fields, and of society. In support of this statement may I sketch his history after returning to Holland.

First as to academic position. On his return from the tropics he succeeded to an honorable post in a distinguished university and an assured position in an established social system. He used these not to rest upon but to build upon. Youth, temperament, and talent contributed to this, but above all was the interest in his subject, the study of living things, especially of plants. After his study of vacuoles in the cells of algae, land plants were his chief concern.

In accordance with the general system in the universities on the continent of Europe, there were students or there were not, in a given subject

in a given place, depending upon whether at that time there was a fertile representative of that subject on the staff. There were, as there are now, centers of study with a man or a group of men as a magnet. Young people were not drawn, as in this country, by the glamor of a historic name—Harvard, Yale, Princeton—but they went to men like STRASBURGER, PFEFFER, VAN TIEGHEM. Utrecht, Leiden, and Amsterdam were intellectual centers, but only because of living leaders in physiology, medicine, and botany, not because of age or geography. So Utrecht, with its very few students of biology, except those going into medicine, was not thought of by young botanists in 1896 as a place to go to and to work in, but it became so. The reason for this was WENT. The change came only slowly, however. For years WENT had no associates in botany of any but subordinate age and position, although ENGELMANN (soon followed by ZWAARDEMAKER) in physiology and PEKELHARING in anatomy were there, and at first whatever botany was taught at Utrecht was given by him. Nearly twenty years later he was relieved by the appointment of PULLE, in 1914, as Professor of Taxonomy and Plant Geography. I emphasize the title of this professorship because of the information it gives as to the thinking of this man, whose early work was cytological and morphological, on one of the plant families (Podostemonaceae). He was concerned with *living* things. In 1917 Miss JOHANNA WESTERDIJK was appointed Professor of Phytopathology in the University of Utrecht and in 1928 or 1929 in the University of Amsterdam as well. In 1930 HONING became Professor of Genetics in Utrecht also, as he already was in WAGENINGEN. In 1926 DE BUSSY, Director of the Museum of the Colonial Institute, became the Professor of Tropical Botany. These appointments illustrate that spirit of scientific cooperation of which WENT was a leading advocate and example.

The record of doctorates in botany at Utrecht in the successive decades of WENT's term as Professor of Botany and head of the botanical establishments in the University is significant.

Between	1896	and	1905	there	were	2	doctorates	in	Botany
"	1906	"	1915	"	"	14	"	"	"
"	1916	"	1925	"	"	17	"	"	"
"	1926	"	1934	"	"	29	"	"	"

These figures must be considered in connection with scientific and economic conditions elsewhere. During the Great War the German universities, to which foreigners had continued to resort, although in decreasing numbers, were closed to the outside world. In 1920 PFEFFER died, a victim of the war. CZAPEK, his successor, died before he could establish himself in PFEFFER's stead. There remained no one in the German-speaking coun-

tries who had won eminence, either by his own work or that of his students, in the Pfefferian type of investigation of plant physiological problems. But WENT naturally became the successor, although he never studied with PFEFFER. So there began that stream of plant physiological studies of respiration, growth, and response, devised and directed by WENT, some of them reported by WENT to the Netherlands Royal Academy, all offered as dissertations for the Doctor's degree, and forming that contribution to botanical science which made the Utrecht laboratory famous.

WENT'S contribution to plant physiology, however, did not consist merely in continuing the kind of work associated with PFEFFER and his laboratory, nor in making as nearly quantitative as possible what had until then been mainly qualitative; but reflecting on the phenomena of growth and wondering about its cause and control, WENT began those investigations continued by his son, by DOLK, and by others, which demonstrate the existence and the importance of SACHS'S postulated "Wuchsstoff." The conception of hormones is now common, and some day it may become clear! At all events the experiments devised by father and son, and made by the son in the father's laboratory, have demonstrated the existence of one or more "Wuchshormone" or auxins, and have definitely introduced into plant physiology the general conception of regulators or coördinators—instigators, inhibitors, etc. The unmaterial stimuli, light, heat, and gravity, affect the distribution of the growth hormones which, if they move from cell to cell or from organ to organ, become "messengers." In this line of investigation one recognizes the bridge which connects the "general" physiology of today with the "old fashioned" physiology of the founders; so that, with hormones, inhibitors, ions, and positive and negative charges, our vocabularies are complete, whatever our knowledge of the living organism may be.

A further contribution of WENT'S to plant physiology consisted in the training and inspiration which he gave to that group of young and vigorous scholars who are continuing and extending his methods, his interests, and his ideals. The inspiration which he received he broadened, deepened, and transmitted. It is thus that a teacher prolongs his life and usefulness.

By travel and by attendance at national and international gatherings of scientific men he extended mutual acquaintance beyond the boundaries of his own country and of his own subject. Not to mention meetings nearer home, he attended, as Government Representative, the International Rubber Congress in Java in 1914; he was at Ithaca, New York, in 1926, attending the international meeting of those interested in the plant sciences; he traveled westward across the North American continent, visiting on the way; and across the Pacific to the Pan-Pacific Science Congress in Japan; and again he was present at the Pan-Pacific Science Congress in Java in 1929, visiting Ceylon *en route*.

On his trip to South America in 1901 he met CATHARINA TOUCHENS, daughter of WARMOLT TOUCHENS, Governor of Dutch Guiana, in Surinam; and they married in 1902. They had five children, namely, FRITS WARMOLT WENT, Professor of Plant Physiology, Pasadena; JOHANNA CATHARINA WENT, Doctor of Phytopathology; JAN JACOBUS WENT, Doctor of Physics, Research Assistant in the laboratories of Philips Inc., Eindhoven; FROUKJE MARIE WENT; LODEWYK NICOLAAS WENT; they, with their mother, survive him.

WENT was a recognized leader in national and international, as well as in local academic matters. He was chairman of the Division of the Physical Sciences in the Netherlands Royal Academy for ten years, 1921–1931; he was to be the President of the International Botanical Congress of 1935, and was directly concerned in all of the preparations for the remarkably pleasant and profitable gathering which took place nearly two months after his death. Throughout the meetings and excursions of the Congress he was spoken of, his loss deplored, his worth acknowledged. The gracious effectiveness with which he would have conducted the meetings of the Congress was the example followed by his substitute, SCHOUTE.

WENT's eminence as a scientific man was recognized by the universities (Padua and Cambridge) which conferred honorary degrees upon him, and by the twenty academies and societies which elected him to membership, foreign, honorary, or corresponding.

The death of WENT this last year brings to a close one of the fullest and most significant lives ever dedicated to science.

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